

LISTING OF CLAIMS

1. (Currently amended) An imaging system to reposition an image capture device in a position relative to a subject of interest according to six degrees of freedom as preserved in association with a reference image of the subject of interest, comprising:

an image capture device;

an automatic repositioning apparatus on which the image capture device is mounted, which, in turn, is mounted on a stable platform, said automatic repositioning apparatus operable to orient the image capture device relative to a subject of interest according to six degrees of freedom;

an acquired reference image of the subject of interest, wherein said acquired reference image is acquired of a random or arbitrary scene of interest, identifying fixed points in said reference image, and wherein said reference image comprises a computational model generated from an initial image of said subject of interest;

a computational device coupled to the positioning apparatus, including a user interface, such computational device capable of receiving images from the image capture device and receiving the reference image, performing a comparison, and communicating adjustments to reposition the image capture device along any of six degrees of freedom, wherein said image capture device captures a new image of the scene of interest, which new image is input to the computational device through the bi-directional path, and said reference image is input to the computational device through said path, whereupon said computational device determines the difference in position of the imaging device, and transmits this information to said automatic repositioning apparatus through said bi-directional path and said user interface indicates the amount and direction of movement required to accurately reposition the imaging

device relative to the scene of interest and where the automatic repositioning apparatus accurately repositions the imaging device if the required displacement is within the range of motion of the apparatus, and if the required displacement is outside the range of motion of the automatic repositioning apparatus, then the user interface instructs the operator to move the stable platform the required distance in the required directions.

2. (Original) An imaging system as in claim 1 wherein the communication of position adjustments is via signals to the positional apparatus from the computational device.
3. (Original) An imaging system as in claim 1 wherein the communication of positional adjustment data is by means of a user interface.
4. (Currently amended) A method for repositioning an image capture device relative to a subject of interest according to six degrees of freedom comprising the steps of:
 - a) initializing an imaging system, where said imaging system includes an imaging device, an automatic repositioning apparatus which also serves to provide a mount for said imaging device, and which, in turn, is mounted on a stable platform, and said positioning apparatus is connected to a computational device which includes a user interface, wherein initializing includes the steps of:
 - a.1) obtaining a reference image of the subject of interest, wherein said reference image is acquired of a random or arbitrary scene of interest, identifying fixed points in said reference image, and wherein said reference image comprises a computational model generated from said initial image of said scene of interest, wherein said reference image includes multiple reference points in 3-dimensional space;

a.2) repositioning an image capture device relative to the subject of interest, where such repositioning uses six degrees of freedom;

b) imaging the subject of interest;

c) computing the difference between the reference image of the subject of interest and the image capture device image, said computational device capable of receiving a stored reference image of an arbitrary scene of interest, such that when said imaging device captures a new image of a scene of interest, which image is input to a computational device, as is reference image of scene of interest, such that said computational device determines the difference in position of the imaging device, transmits position difference information to automatic repositioning apparatus and indicates via user interface amount and direction of movement to accurately reposition imaging device relative to scene of interest;

d) refining the position of the image capture device by the automatic repositioning apparatus and where the required displacement is outside the range of motion of the automatic repositioning apparatus, then the user interface instructs the operator to move the stable platform the required distance in the required directions, so that the image capture device is in the same position relative to the subject of interest as that position from which the reference image was obtained, where such position refining the position of the image capture device occurs along six degrees of freedom.

5. (Original) A method as in claim 4 in which the step of initializing further includes the step of generating a three dimensional model of the subject of interest through selection of reference points in the subject of interest.
6. (Original) A method as in claim 4 where the reference image is obtained after fixed reference points have been selected in the subject of interest.

7. (Currently amended) A method as in claim 4 where the step of initializing includes extracting reference points from more than one image of the subject of interest representing more than one camera center.
8. (Original) A method as in claim 4 where time has elapsed between the initialization process and the repositioning of the image capture device.
9. (Original) A method as in claim 4 where the computation of position is communicated to an automatic position correction apparatus.
10. (Original) A method as in claim 4 where the computation of position is communicated to the user through an interface.
11. (Currently amended) An apparatus for positioning an imaging device (also denominated a "positioning apparatus") and coupling to an image capture device

and where such apparatus positions said image capture device along six degrees of freedom, such that the positioning of the image capture device is controllable and said apparatus orients the image capture device relative to a subject of interest using six degrees of freedom to orient the image capture device, and wherein said positioning of said image capture device relies on a reference image of the subject of interest, wherein said reference image is based on an initial acquired image of a random or arbitrary scene of interest, where said initial acquired image enables the identification of fixed points in said reference image, and wherein said reference image comprises a computational model generated from said initial acquired image of said subject of interest; and

where said positioning apparatus, coupled to said image capture device, is mounted on a stable platform, and said positioning apparatus is connected to a computational device, said computational device capable of receiving a stored reference image of an arbitrary scene of interest, such that when said imaging device captures a new image of a scene of interest, which image is input to a computational device, as is reference image of scene of interest, whereupon said computational device determines the difference in position of the imaging device, and transmits position difference

information to automatic repositioning apparatus, and, user interface indicates amount and direction of movement to accurately reposition imaging device relative to scene of interest, and the user interface instructs the operator to move the stable platform the required distance in the required directions where the required displacement is outside the range of motion of the automatic repositioning apparatus.

12. (Original) An apparatus as in claim 11 where the positioning of the image capture device is automated.